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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/022,103   | 12/13/2001  | Damian Flannery      | 14125IDUS02U        | 2514             |
| 7590   | 12/12/2003  |                      | EXAMINER            |                  |
| Christopher J. Cianciolo, Esq.<br>Nortel Networks Limited<br>600 Technology Park Drive<br>Billerica, MA 01821-5501 |             |                      | MOSKOWITZ, NELSON   |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 3663                |                  |

DATE MAILED: 12/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                              |                  |
|------------------------------|------------------------------|------------------|
| <b>Office Action Summary</b> | Application No.              | Applicant(s)     |
|                              | 10/022,103                   | FLANNERY ET AL.  |
|                              | Examiner<br>Nelson Moskowitz | Art Unit<br>3663 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-18 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-18 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 December 2001 is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
  - a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)           | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____                                     |

**Application 10/022103**

**DETAILED ACTION**

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The terminology of "in step (b)", as set forth in claim 1, plus "in step (a)" recited in claims 3 and 6, and steps a-c missing in claim 3, the lack of antecedent basis and the omission of steps a-c, render these claim indefinite.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

3. Claims 1 and 4 (to the extent they are now understood), 7, 12-14, 17 and 18 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Monnard et al. See, inter alia, computer 24, amplifier 18, and gain stage 46 ; figures 10 and 11; and columns 3-9 and 11.

Please note that the specific reference constituents cited herein are done so for the convenience of the Applicant and are in no way intended to be limiting. The reference should be considered in its entirety.

4. Claims 1-6 (to the extent they are now understood), and claims 7-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Monnard et al, when taken with Park et al or Horiuchi et al.

In determining obviousness, the following factual determinations are made:

- a. First, the scope and content of the prior art.
- b. Second, the difference between the prior art and the pending claims.
- c. Third, the level of skill of a person on ordinary skill in this art;
- d. Fourth, whether other objective evidence may be present, which indicates obviousness

or nonobviousness. See, e.g., *In re Dembiczaik*, 175 F.3d 994, 998, 50 USPQ2d (BNA) 1614, 1616 (Fed. Cir. 1999) citing *Graham v. John Deere Co.*, 383 US 1, 17-18, 148 USPQ2d (BNA) 459, 466-67 (1966).

Objective evidence includes long felt but unmet need for the claimed invention, failure of others to solve the problem addressed by the claimed invention, and other factors. See e.g.

*Simmons Fastener Corp. v. Illinois Tool Works, Inc.*, 739 Fed. 1573, 1574-76, 22 USPQ 744, 745-47 (Fed. Cir. 1984).

Examining the scope and content of the prior art one finds the following:

- a. Monnard et al disclose prior art optical signal transmission systems with Raman amplification, pump power modulation, and pump power gain modulation detection as claimed. However, this reference does not disclose detection of modulation depth with pump power adjustment dependant on the depth.
- b. Both Park et al and Horiuchi et al teach detecting modulation depth and control of the pump power based upon modulation depth values. See, inter alia, columns 7-8 of Park et al,

and figures 5-6 of Horiuchi et al. These references teach the benefits of optimizing system operation, and especially gain, from such operation.

Secondly, under Deere, the difference between the claimed invention and the prior art lies in the combination of modulation depth monitoring and use in pump control, with the Raman amplifier system of Monnard et al.

Third, under Deere, the level of ordinary skill in this art may be determined by the analysis of the Court as set forth in Environment Designs Ltd. v. Union Oil Co., 713 F. 3d 693, 281 USPQ 865-69 (Fed Cir. 19830 cert. denied, 464 1043 (1984)), where the court listed factors relevant to a determination of the level of ordinary skill; type of problems encountered in the art, prior art solutions, rapidity of innovations, sophistication of technology, and educational level of active worker in the field.

The types of problems encountered in the art involve inadequate pump control in fiber optical communication systems with feedback control, and the great expense of the optical fiber amplifiers.

Innovation in this field has been very fast as can be seen from virtual birth of this field in the 1970s to its present highly complex and sophisticated status.

Prior art solutions include Raman amplifiers with feedback systems. Skilled artisans generally have graduate level education and over seven (7) years of experience, as can be seen from published articles in the major journals in this field, e.g. IEEE Photonics Technology Letters, Optical Communications, Optics, Optical Fiber Technology, Electronics Letters, etc.

To date, no secondary consideration (objective evidence) has been presented.

Therefore, as the above prior art teaches the benefits of using modulation depth feedback for pump control in order to optimize gain and general system operation, all as set forth above, such combination would have been obvious to one of ordinary skill in this art.

As the aforesaid prior art is known by optical physicists to provide the respective benefits and improvements as set forth above, the physicist would have been led to make the obvious combination of these teachings in order to obtain the benefits this prior art taught and the artisan would typically readily recognize.

5. References D-I (PTO-892) are cited to show the widespread knowledge of using Raman amplification in fibers with feedback control of the pumps. Reference I shows the use of dithering in optical fiber pump systems.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson Moskowitz whose telephone number is 703-306-4165. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 4:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Thomas Black, can be reached on (703) 306-4171. The before final fax phone number for the organization where this application or proceeding is assigned is 703-872-9326. The after final fax phone number for the organization where this application or proceeding is assigned is 703-872-9327.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.



NELSON MOSKOWITZ  
PRIMARY EXAMINER